SYNERGY 4
DIGITAL PRODUCTION SWITCHER
MD-X

MULTI DEF

ORDERING GUIDE

ROSS
Cool Practical Technology™

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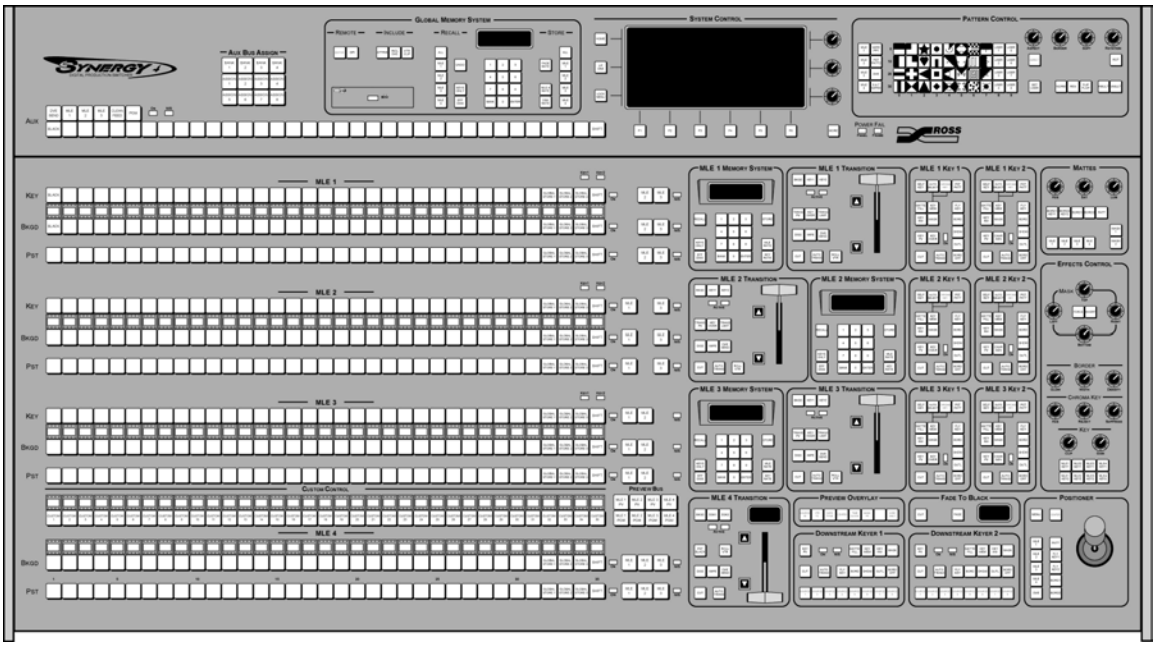


Synergy 4 MD-X Control Panel

Product Overview

Thank you for considering the purchase of a Synergy Multi-Definition Digital Production Switcher. Each switcher in the Synergy MD family is a true multi-definition production switcher and comes fully equipped with support for a wide variety of SD and HD video formats. Synergy MD is based on the latest technology in both hardware and software, offering a readiness for the future that is unmatched in the industry. Unlike other products on the market, no costly upgrades are required when moving from SD to HD. All that is required is a simple software setting change. Whether your production is in HD or SD, Synergy MD will work for you - right out of the box.

Upgradeable from Synergy SD systems!

Already a Synergy SD owner? If so, you are already half way to a multi-definition switcher. Synergy SD control panels can connect directly to the new MD chassis, providing a smooth and cost effective upgrade path to multi-definition while maintaining a consistent user interface and operational feature set.

Designed for Live!

Synergy MD retains its heritage as a switcher designed for live news, live sports, and live production. At the center of the action, it is important that the switcher be powerful and versatile, yet maintain its ease of operation. This frees the operator to concentrate on the programming instead of the equipment, delivering a cleaner more professional production.

Designed for You!

With production switchers installed in over 100 countries world wide, our sales, demonstration, and training people get considerable ongoing feedback from customers. This feedback is carefully tracked and included in the design and feature set development of our production switchers. The Synergy MD series, our fifth generation of switchers, was designed with the direct input of video professionals experienced in news, sports, drama, and mobile production. Key members of the Synergy design team are part of an ongoing program in which they provide switcher demonstrations, assist with switcher installation, and train operators. As a result, the Synergy line continues to offer our legendary combination of power and ease of use.

Join our Growing Customer Base!

Deciding to purchase a Synergy multi-definition switcher will put you in good company, with many thousands of installed switchers worldwide. Synergy switchers deliver the goods every day in live sports, stadium scoreboards, and drama productions, as well as local and network newscasts.

Experience Great Support!

Ross Video has designed and manufactured production switchers for over thirty years with significant year over year growth of 25% for the past 12 years. We believe that an important factor of our success is our focus on providing a superior customer experience. We continually benchmark our warranty and technical support to ensure that they are the best in the industry.

We hope that you join the many thousands of satisfied video professionals around the world that are proud owners of Ross production switchers. Please do not hesitate to contact us with any questions or comments you have related to this Ordering Guide at Tel: +1-613-652-4886, Fax: +1-613-652-4425 or email us at solutions@rossvideo.com

Product Highlights

Multi-Definition. Future-proof right out of the box, Synergy MD allows you to work in either SD or HD. Synergy MD supports 480i (SD 525), 570i (SD 625), 720p, and 1080i.

Huge Input Matrix. The Synergy MD-X frame can accept more of your sources directly with up to 96 multi-definition video inputs, available in groups of 16.

Huge Output Matrix. The Synergy MD-X frame provides up to 48 fully configurable multi-definition video outputs, available in groups of 16.

Incredibly Powerful MD-X Chassis. The Synergy MD-X multi-definition frame is, by far, the most powerful switcher in the world. It has 96 Multi-Definition Inputs, 48 Multi-Definition Configurable Outputs, 16 DVE Channels, 28 Internal Keyers, 4 WARP Generators, 19 Internal Ethernet-connected Media Stores, and 13 Classes of External Interfaces. Add Proc Amps, RGB Color Correctors, utility Buses, FlexiClean™, Preview Overlay, Linux OS, and a whole lot more, and the result is nothing short of revolutionary. Amazingly, it fits into a rack-saving 8 RU.

OverDrive™ Compatible. The Synergy Series has evolved to control every single piece of equipment in the control room. The next step in this evolution is the revolutionary OverDrive Production Control System. With dual touch screens, the TD can now automate a production when required. Thumbnail based, the TD can step through the show's run-down or instantly break away to unscripted events. When connected to a newsroom automation system, a live MOS-based link keeps the two systems in constant and instant synch, providing clear communication between the producer and the TD.

Mnemonics. Synergy Mnemonics are perfect for mobiles and other applications that require different source names from one production to another. Mnemonics are available for every MLE as well as the Custom Control button row. Every display can have individual settings for display color, text size, and backlighting to provide clear naming and source group separation.

Preview Overlay. This unique option allows the technical director to keep his/her eyes on the action by presenting key information overlaying the preview monitor output. Included is a VTR and video server time code, a count up/down timer, source ID, safe title, and more - each individually selectable via handy control panel buttons.

Squeeze & Tease® MD. Squeeze & Tease MD is a high quality, powerful multi-definition 3D DVE that can be built into every MLE. Great for sophisticated looking boxes, it allows every type of key to be squeezed or zoomed, cropped, repositioned, and rotated in 3D space. It can also perform 3D key or background transitions, or build sequences with complex timelines, keyframe editing, and quick "shot box" sequence recall. Squeeze & Tease MD comes equipped with a positionable light source, preprocessor effects such as defocus, mosaic, posterization, colorization, strobe, picture frame borders, object builder for slabs, timeline sequences with holds, and a lot more. Up to 4 channels of Squeeze & Tease MD can be added to every MLE.

Squeeze & Tease® MD WARP. Stunning curvilinear transitions and creative effects are possible when this option, which adds warp capability to Squeeze & Tease MD, is included. Over 20 classes of modifiable WARP effects are provided, such as page turns, spheres, ripples, 3D hearts, stars, sandstorm, old film effects, and more.

UltraChrome™ Advanced Chroma Keying in every MLE. Our new UltraChrome chroma keyer uses new Ross technology to perform detailed keying in the most demanding applications. Each MLE includes one UltraChrome chroma keyer as a standard feature.

3 Channel Global-Store™. Three independent channels of stills are available switcher-wide. Thousands of stills and logos can be stored in the on-board hard drive and are transferable to other control-room devices via Ethernet using Synergy ImageMover™ software.

MLE-Store™. Every MLE can have four channels of dedicated still store. These channels can be paired for video + key operation. MLE-Store has the same capabilities as the Global-Store and has rapid access to all of the stills stored on the system hard drive.

MediaCache™. In addition to the 3 Channel Global-Store that comes standard with Synergy MD-X systems, animated logos, moving graphics, and short uncompressed clips can optionally be played out of the Global-Store and the MLE-Store.

Ethernet Connectivity. Upgrades can be done from a PC using an Ethernet port on the rear of the frame. Images and animations can be copied from a PC to the switcher's internal hard drive for use by the still stores and MediaCache throughout the system. The Ethernet port can also be used to transfer images and animations from the hard drive on the switcher to a PC. This allows images captures on the switcher to be used elsewhere in the studio.

Networked Still and Clip Server. Imagine hours of video storage, virtually unlimited stills, and animations all playing out with their companion key channels. Next, combine live video and key capture with Ethernet drag and drop capability, and you have the perfect marriage of video and networkability. Even better, this solution comes bundled with Synergy MD's powerful Video Server Control. **Note**: This option is available in SD only.

AuxKeys™. Brand or add titles to Auxiliary Bus outputs or mix between Aux Buses. Feed the result to external monitors or send them back into the switcher to further increase the switcher's production power. This revolutionary option adds mixing and keying capability to Aux Bus outputs. Mix and key sources are fed from adjacent Aux Buses that have access to every signal in the switcher. Of particular interest in this application are Global-Store outputs that, with MediaCache enabled, can provide animated logo capability.

MultiDSK™. Time, temperature, and bug logos are often added downstream. This option adds two more downstream keyers to the Synergy MD-X system, bringing the total number of DSKs in the system to four. The keyers have full access to the internal crosspoint matrix making every source available as a downstream key.

Internal Proc Amps. Synergy MD makes your sources look great even when they have been misadjusted. Fixes are easy as every MLE video input can have luma gain, chroma gain, and chroma phase adjustments.

RGB Color Correction. Creative color adjustments are available with the optional RGB Color Correction option. Every MLE video input can have RGB Color Correction applied.

Powerful MLEs. Synergy MD packs major effects and keying power into every MLE. Each one has two fully featured keyers with luma, linear, preset pattern, and an advanced UltraChrome chroma keyer. Each MLE has a utility bus input for video-in-border and garbage mask applications and a repositionable clean feed output. Two advanced pattern generators per MLE include rotary wipes, matrix wipes, heart, star, and pattern rotation. Two additional pattern generators are dedicated to color wash generators.

VTR Control. Select a VTR on the PST bus, display its current time code on the preview monitor, roll it from the transition area, and take it to air. Fast forward, rewind, and cue to time code are also available at the touch of a button on the control panel.

Video Server Control. Select, play, and monitor server clips by name right from the Synergy 4 control panel. The clip menu keeps track of clips and allows instant recall and cue.

Audio Server Control. Controls the DigiCart™ audio server. Dial up the desired clip and see the name and duration. Use a Custom Control macro button to link audio clips to a switcher or DVE transition.

Router Control. This option makes your plant router sources easily selectable directly from the Synergy MD-X system control area. Any number of Synergy MD-X's 96 inputs may be fed from a router output. Router mnemonics are supported, with the router 8-character source name being displayed on the system control area, mnemonic displays, and Preview Overlay source ID text.

Serial Tally Interface. Interfacing to Under Monitor Display and Tally Systems is easy with this option. The Serial Tally Interface uses industry standard tally protocols to communicate tally information on an RS-422 serial port to other devices.

Peripheral Bus II Interface. This option provides support for Thompson GVG™ Peripheral Bus II Protocol for external device integration. Coordinate the store and recall of the settings of some still stores, CGs, and device controllers with the store and recall of your Synergy settings.

Audio Mixer Interface. Large or small mixers can be controlled serially from your Synergy MD control panel, making an integrated A/V production possible.

Robotic Camera System Interface. Pan, tilt, zoom, focus, shot recall and more, are directly controllable from your control panel when this option is added to Synergy MD-X.

Custom Control Macro Buttons. 35 dedicated macro buttons (shiftable to 216) have been positioned close to the operator for powerful single touch control. Recall any combination of switcher memories, button pushes, and external device control with our editable macro system.

External DVE Integration. Advanced DVE effects from all popular DVEs are seamlessly integrated as switcher transitions with unmatched ease and power. Not only can a Synergy peel off backgrounds and keys, it can pre-key backgrounds and one or two keys together, and then peel off the result! The process uses special layering hardware to make this possible. Even better, Aux Buses, tallies, and video path control are all handled automatically.

Growth Path. The same video-processing frame is used for our Synergy MD 2, 2.5, 3, 3.5, and 4 MLE switchers. Buy a smaller system now and then add another MLE and a larger control panel as your needs grow.

Compatible with Synergy SD Panels. The Synergy MD-X frame connects to the same control panels as the economical Synergy SD frame.

Compatible with the Synergy MD Compact Rack Frame. Most boards used in the 8 RU Synergy MD-X rack frame also plug into the Synergy MD 3 RU compact rack frame. This allows for consistent operation, maintenance, and spare parts across the entire product line.

Hot Swappable Cards. All cards in the Synergy MD-X frame can be safely removed with the power on. If any card is plugged into the wrong slot, the card and system hardware will not be damaged. In addition, Synergy MD-X was designed to support emergency swapping of some circuit boards even during live operation.

Upgrades from the Web. Software and even some hardware can be upgraded by downloading files from our web site. It's fast and it's easy.

Affordable. A powerful switcher at a great price!

Built to Last. Ross warranties save thousands in operational costs over competitive products. It's no secret that Ross products are tough. They're built to handle years of demanding, continuous use. The Synergy MD-X series is backed by a comprehensive 3-year *transferable* warranty. The design of our fourth generation fader bars is so good that they are guaranteed for life.

Your purchase decision must be based on a careful look at your present and future programming requirements. To ensure your investment is an informed one, and that the switcher is equipped for your programming needs, Ross Video has put together this Ordering Guide for the Synergy 4 MD-X. In this guide, we describe the Synergy 4 MD-X and its many standard and optional features. As you go through the information, please feel free to call us. We will be happy to address any of your questions.

Standard Features

16 Multi-Definition Serial Digital Inputs

The Synergy 4 MD-X switcher comes standard with 16 inputs (optionally expandable in groups of 16 up to 96). Any input can be assigned to any control panel pushbutton - simplifying installation. These inputs can be used for video, alpha channel, or mask.

16 Multi-Definition Serial Digital Outputs

The Synergy 4 MD-X switcher comes standard with 16 outputs (optionally expandable in groups of 16 up to 48). Outputs are fully configurable and can be used as MLE Program, MLE Preview, MLE Clean Feed, Preview Overlay, External DVE Send, MultiDSK, Aux Bus, or AuxKey.

Analog Reference Input

Tri-level sync is recommended for HD applications. The same looping connector will accept standard color black as a reference in SD applications.

3 Channel Global-Store

Three independent channels of stills are available switcher-wide. Thousands of full screen stills and logos can be stored in the on-board hard drive and are transferable to other control-room devices via Ethernet using Synergy ImageMover™ software, which also comes standard with the Synergy 4 MD-X.

Global-Store comes standard with 256 Megabytes of RAM storage. This translates to at least 30 full screen 1080i images with key or 189 full screen 480i images with key. The number of images stored increase considerably when smaller, non-full screen images like logos are stored. Thousands of additional images can be loaded quickly from the system hard drive. When the optional MediaCache for Global-Store is enabled, the playout capabilities and storage capacity of the Global-Store are increased considerably.

Four Full Multi-Definition MLE Effects Systems

Standard equipment on the Synergy 4 MD-X includes four full MLE (Multi-Level Effect) systems. Both keyers in an MLE can matte fill, key invert, pattern mask, box mask, garbage mask, self-key, linear key, and preset pattern key. A "floating" UltraChrome advanced chroma keyer is standard on each MLE with optional key bordering. Each MLE has a dedicated utility bus for video-in-border applications. All MLEs have a comprehensive external DVE send/return path in addition to similarly powerful internal DVE send/return paths. Up to four channels of optional 3D DVE and one WARP engine can be dedicated to each MLE in addition to external DVE connectivity. Each MLE provides two wash generators that incorporate extensive wash patterns, matte video effects, and noise effects. Full preview is always available to reduce on-air surprises.

Sixteen Pattern Generators

On the Synergy 4 MD-X, there are four advanced generators used for wipe transitions and PST PATT 1 and four advanced generators for PST PATT 2. Eight additional pattern generators are used for wash generators that are available as MLE inputs or anywhere a matte is used. The advanced wipe generators come equipped with classic, matrix, rotary,

heart, and star wipes. All wipe types can be rotated, bordered, and repositioned. The additional wipe generators are identical to the advanced wipe generators except that unneeded matrix capability has been removed.

20 Matte Generators

Each MLE has three simple color generators and two complex ones capable of multi-color washes. Any one of the color generators can be assigned to COLOR BKGD1 or 2, key fill 1 or 2, key border 1 or 2, or wipe pattern edges. Note that each MLE has its own dedicated COLOR BKGD video inputs to make memory recalls of individual MLEs simple and predictable.

UltraChrome Advanced Chroma Keying

Chroma keying is available to every keyer in the switcher - including DSK1 and DSK2. The Synergy 4 MD-X is capable of putting up to four different UltraChrome chroma keys on air at the same time. One "floating" UltraChrome chroma keyer per MLE, which is easily assignable to either key 1 or key 2, comes standard.

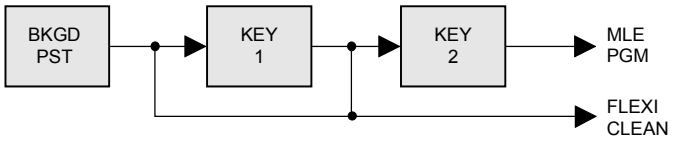
The Ross UltraChrome™ (patent pending) uses advanced video processing technology to provide exceptional blue spill reduction and clean edges, even with difficult source material. Glass, smoke, translucent materials, and natural shadows are handled superbly. Setup is a breeze with single-touch auto chroma keying and intuitive touch-up controls.

Chroma key shadows can either be extracted from the source image or simulated using the switcher's optional border generators.

4 FlexiClean™ MLE Clean Feed Outputs

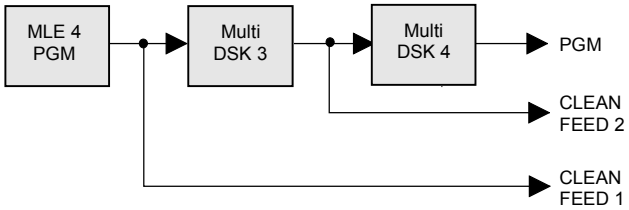
Each MLE can have its own fully programmable clean feed output. This feature is used for bilingual and live-to-tape productions. It provides a second "program" output that is derived from a different location than the standard program output. A frequent application is the recording of shows for later airing without "call in" phone numbers inserted.

The clean feed output can come from before or between the keyers in the MLE. Each MLE has its own, independently configured clean feed output separate from all other clean feed outputs. The diagram below illustrates the possible clean feed configurations for MLEs 1 through 4 inclusive.



Clean Feed Modes for MLEs 1 through 4 Inclusive

The diagram on the following page displays clean feed output configurations available on the bottom Program/Preset MLE with the option **S4MDX-056: MultiDSK (DSK 3 and DSK 4)** installed.



Clean Feed Modes for MultiDSK

Preview Overlay

This feature makes it possible to present various types of useful information onto the main preview matrix output. This information is color-coded, and can be positioned and resized according to user preferences. There are eight buttons in the Preview Overlay area of the switcher panel to control and display the following types of information:

Source Identification

Source ID displays the name of the current background video, current preset video, and transition type. When the **S4MDX-905: Routing Switcher Interface** option is installed, router source names are displayed in addition to switcher source names.

VTR Time Code

If a VTR, disk recorder, video server, or other device using a time code is the current background of your main preview output, its current time code will be displayed (e.g., 12:59:59:23). The device's remote port must be connected to the switcher, and option **S4MDX-901: VTR Remote Control** and/or option **S4MDX-903: Video Server Control** must also be purchased.

Configurable Safe Title, Safe Area, and Center Cross Hairs

This places a SMPTE standard safe title, safe area, and center indication over the main preview output, all of which can then be adapted to fit your specific application. This is great for ensuring a clean 4:3 extraction from a 16:9 shot and talent and graphic positioning.

Time Clock

This places a configurable timer on the main preview output. This timer can be made to restart every time a background transition occurs on air. This is ideal as a show, commercial, or segment timer.

Mask Preview

This places a thin outline on the main preview output around the current active box mask.

16 Configurable Multi-Definition Timed Digital Outputs

In the Synergy 4 MD-X, every output is fully configurable and as a result there are no outputs that are specifically dedicated to be program, preview, clean, Aux, etc. Output mapping will vary greatly from one installation to another depending upon local requirements.

The following signals are available from the crosspoint matrix to the output cards in a standard system with no additional I/O cards installed.

Crosspoint Matrix Video Signals	Quantity
Black	1
Standard Primary Inputs	16
Global-Store (and optional MediaCache)	3
External DVE Send Video and Alpha (if purchased)	2
MLE 1, 2, 3, & 4 PGM	4
MLE 1, 2, 3, & 4 PV	4
MLE 1, 2, 3, & 4 FlexiClean Clean Feeds	4
MLE 1, 2, & 3 Look Ahead Preview	3
Preview Overlay ("Preview Matrix")	1
Total Sources available	**38**

Not included in the above tally are signals generated by:

- The optional MultiDSKs DSK 3 and DSK 4
- Processed Aux Bus feeds when the optional AuxKeys are activated
- Additional primary inputs (up to 80 more!), if additional video input cards are installed

Every output is fully timed to provide consistent and adjustable output phasing.

Intuitive Control Panel with Keyboard Port

The Synergy 4 control panel comes standard with the Synergy 4 MD-X system. Note that the control panel includes a PC-compatible keyboard port to ease switcher setup and still management.

USB Media Drive, Hard Disk Drive, and System Control Area

This feature makes it possible to store and recall complete switcher setups including memory functions, switcher personalities, installation parameters, and more, to a USB key. This allows operators and technical staff to back up their switcher setups and easily transfer these settings to other Synergy MD production switchers.

The system hard disk drive is located in the Synergy MD-X chassis. Switcher settings can also be stored here for quick recall. This is the same hard disk drive that is used to store stills, logos, animated logos, and short video clips. Memories and graphics files are accessible over the 10/100 Ethernet network port for easy remote load and backup.

Also included in this feature is the large crisp display with dedicated soft-buttons and soft-knobs that are used to configure the switcher and to provide advanced operational features.

Custom Control Macros

This feature brings the power of macros to the switcher operator. A series of button presses can be easily recorded and attached to any of 35 dedicated buttons (shiftable to 216) that are positioned close to the operator. Step through complex show openings as easily as pressing Custom Control buttons 1, 2, then 3. Confusing timeline programming is a thing of the past.

Custom Control buttons can also be used to control remote devices or other optional switcher features such as:

- Trigger a GPI to advance to the next page of your still store
- Attach external DVE remote control commands, such as go to start, run forward, and run reverse, to simplify your productions
- Play, stop, or shuttle, up to eight VTRs or video servers
- Trigger a DigiCart™ audio server and tie sound effects to wipes and external DVE effects
- Recall a robotic camera scene along with a switcher memory.
- Recall an audio mixer setting for an integrated audio follow video production
- Any number of pauses, holds, and events can be added to any macro,
- And many additional sophisticated features.

Custom Control macros can be viewed and edited directly on the switcher menu.

When the option **S4MDX-505: Mnemonics for Custom Control Macros** is installed, color-coded macro names are presented directly above the buttons. This is especially useful when several banks of macros are in use.

100 Event Memory System

The Synergy 4 MD-X comes standard with storage for 100 complete switcher snapshots. They're easily stored and recalled at the touch of a single button. If you don't want to recall the entire switcher at once, you can recall any area of the switcher: MLE 1, 2, 3, or 4 in any combination you desire from a keypad dedicated to that MLE.

All of these memories can be stored to disk providing custom tailored memories for every operator and every show.

You can even give your memories names - such as "SPORTS". An alphanumeric display in each MLE will tell you what you've recalled - or what you're about to recall.

Clear and Intuitive Displays and Indicators

The Synergy 4 MD-X always lets you know what's going on. Bright red lights at the end of every bus quickly show what's on air. Yellow non-sync lights warn you that an input is untimed and might cause problems. Lights under the key transition buttons and in the keyers glow red when the key is on air or green when they are active but the MLE is not on air.

Every auto transition rate is constantly visible - including the main transition rates, the dedicated keyer rates, and the fade to black rate. The last memory number recalled per MLE is also displayed along with an associated eight-character memory name.

General Purpose Interface

The Synergy 4 MD-X is equipped with ten dedicated GPI inputs and ten dedicated GPI outputs.

The GPI inputs allow the switcher to interface with peripheral equipment such as editors and DVEs. Each GPI input can be used to perform simple editing and switcher functions such as fade to black or an auto transition on one of the switcher's MLEs. GPI inputs can trigger Custom Control macros, making it possible to trigger complex timelines. For industry standard serial editing capability, option **S4MDX-900: Editor Interface** is available.

GPI inputs can be used by DVEs to indicate Aux Bus on air status to the switcher. For more complex DVE integration, refer to option **S4MDX-902: DVE Send and Remote Control**.

GPI outputs are used to trigger remote events like "Still Store Next Page" and are activated through the switcher's Custom Control macro system.

Emergency Bypass Tallies

The Synergy MD-X frame also includes 2 dedicated power-fail relays. These normally closed relays open in the event of a power failure, or other system fault that prevents a reliable program output (for example, removal of a Video Output card). These relays can be used to control an external emergency routing system.

36 Tally Outputs

The standard system includes 36 tally relays located in the control panel conveniently close to your monitors. Any tally can be assigned to any video input (or MLE program output) making 36 enough for most systems. As each tally is assignable, more than one tally can be assigned to the same source. This can simplify system cabling in situations such as when camera tallies must be supplied to both the camera itself and the control room monitor wall.

An optional 36 additional tallies can be ordered for red/green preview tally systems and Aux Bus tally systems that require twice as many tallies or for cases where more than 36 inputs must be tallied. See option **S4MDX-070: Extended Tallies**.

System Manuals

The Synergy 4 MD-X comes with a complete set of system documentation that includes an Operator's Manual and an Engineering Manual.

10 Meter Control Cable

A single, standard 8-pin flat-shielded Telco cable that uses high speed RS-422 communication connects the Synergy 4 control panel and MD-X rack frame. The maximum cable length between the control panel and its rack frame is 1,000 feet or 305 meters.

Standard System

Note

When ordering, please specify the Ross Part Number listed with the option description.

Synergy 4 MD-X S4MDX-001C
Multi-Definition Production Switcher (COLOR buttons)

This is the MD-X rack frame plus the Synergy 4 control panel with distinctive Ross COLOR buttons on the MLEs and keyers – white, yellow, orange, and red/white.

Synergy 4 MD-X S4MDX-001W
Multi-Definition Production Switcher (WHITE buttons)

This is the MD-X rack frame plus the Synergy 4 control panel with the new Ross WHITE buttons on the MLEs and keyers.

Please see the section titled **Standard Features** for a full description of the Synergy 4 MD-X and its many included features.

Note

Some options listed in this Ordering Guide are not immediately available for shipment. Please contact your Ross representative for an up to date listing of current delivery dates.

System Options

Options are typically ordered when the switcher is purchased. However, if you are not 100% certain which options you will need in the future, you don't need to feel pressured into making that decision today. All of our options can be easily installed in the field. You can take comfort in knowing that options can be purchased as your needs develop and that installation at your site will be a smooth process.

Synergy 4 S4MDX-002BC
Control Panel Only (COLOR buttons)

This is the Synergy 4 MD-X Control Panel only with the distinctive Ross COLOR buttons on the MLEs and keyers – white, yellow, orange, and red/white. This option would be ordered when upgrading from a smaller switcher or an older control panel.

Synergy 4 S4MDX-002BW
Control Panel Only (WHITE buttons)

This is the Synergy 4 MD-X Control Panel only with the new Ross WHITE buttons on the MLEs and keyers. This option would be ordered when upgrading from a smaller switcher or an older control panel.

MD-X Live Production Engine (Rack Frame) S4MDX-007

This option is for those with an existing Synergy 4 control panel who wish to upgrade their rack frame to an MD-X system. The rack frame comes equipped with everything that is included in the base Synergy 4 MD-X electronics. Options must be added as required.

Mnemonics Controller Board Set S4MDX-005

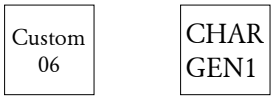
This pair of circuit boards is a prerequisite for mnemonics on the Synergy 4 MD-X control panel. Together, they control all of the mnemonic displays in the switcher. Note that this option is ordered once per switcher to enable mnemonics across the entire control panel.

Mnemonics for MLE Sources S4MDX-x05

This option puts 35 mnemonic indicators for the display of source names directly above the program (background) bus of the MLE selected. Note that "x" in the option number can be 1, 2, 3, or 4 corresponding to MLE 1 though 4. Any combination of MLEs can have mnemonics installed either in the factory, or retrofitted in the field.

Source names can be displayed in three formats, and all formats can be intermixed on a single bus as desired:

- 8 character mnemonics. The full eight-character source name is displayed in two lines, in either small or normal font. If the shift button is pressed, the display changes to the shifted source name.



Small Font
8 Characters

Normal Font

- 1 or 2 character large font mnemonics. These large characters fill the entire display. This is an ideal way to identify sources like cameras as **1, 2, 3** and VTRs as **A, B, C**.

Large Font

- Dual six character mnemonics. This uses the small font to simultaneously display the first six characters of the shifted and unshifted source names associated with a crosspoint button. The shifted crosspoint appears in "reverse video" mode.

Mnemonics can be displayed with green, yellow, or orange backlighting, chosen on a source-by-source basis. Backlighting can also be turned off for sources that have been deactivated or are unused on a given production. Source names can also be displayed in normal and inverted ("reverse video") in all modes. These extensive display appearance choices provide an excellent way of differentiating between source buttons during a live production.

When the **S4MDX-905: Routing Switcher Interface** option is installed, switcher source names are replaced by router source names.

This option is ideal for mobile and other applications where sources are constantly being associated with different crosspoint buttons from one production to another. This option is also useful when it is desirable to simplify a production by showing only those sources that will be used in that production and not all of the sources currently connected to the switcher.

Note that **S4MDX-005: Mnemonics Controller Board Set** must be ordered to enable mnemonics.

Mnemonics for Custom Control Macros S4MDX-505

This option puts 35 mnemonic indicators for the display of Custom Control macro names directly above the Custom Control macro row of the switcher.

It is common for operators to create and name their own Custom Control macros for a given production. This option allows those customized macros to be named for easy selection.

A very important feature to note is that Synergy MD supports up to eight banks of Custom Control macros simultaneously. Up to eight macro buttons can be configured as "shift" buttons that change the assignment of all of the other macro buttons. Installing the mnemonics makes this feature considerably easier to use by instantly relabeling all of the Custom Control buttons when a new bank of macros is selected.

All Custom Control macros can have names of up to eight characters, and can be displayed in any of the formats outlined in **S4MDX-x05: Mnemonics for MLE Sources** above.

Mnemonics can be displayed with green, yellow, or orange backlighting, chosen on a macro-by-macro basis. Backlighting can also be turned off for macros that are empty. Macro names can also be displayed in normal and inverted ("reverse video") modes. These extensive display appearance choices provide an excellent way of differentiating between Custom Control buttons during a live production.

Note that **S4MDX-005**: **Mnemonics Controller Board Set** must be ordered to enable mnemonics.

MediaCache™ for Global-Store™ S4MDX-010

MediaCache enables the playout of animated logos, moving graphics, and short uncompressed clips from the Global-Store. Each output is capable of playing full bandwidth clips independently and simultaneously.

The duration of the clips depend upon the size of the clips being used. Full screen 1080i images will take 5 times the storage of a 480i clip. However, a small, animated logo in 1080i will take much less storage than a full screen 480i clip. Purchase of MediaCache for Global-Store increases the RAM capacity from 256MB to 1GB. This allows storage of up to 4 seconds of uncompressed 1080i playout or 25 Seconds of 480i playout.

Clips and animations are loaded from the system hard disk to local Still Store RAM at power-up or when new clips are requested. Clips are transferred from external computers to Synergy MD-X via Ethernet using Ross ImageMover software. ImageMover software is included with Synergy MD-X as a standard feature.

Note: MLE-Stores with MediaCache are also available as system options. Refer to **S4MDX-x44** and **S4MDX-x45** for more details.

Proc Amps, System Wide S4MDX-012

Every MLE video input can have luma gain, chroma gain, and chroma phase adjustments.

Processing Amplifiers are configured "per input" for all 96 inputs.

This feature is particularly useful for correcting analog level and chroma phase errors caused by system timing errors, transmission losses, and incorrect equipment calibration.

RGB Color Correctors S4MDX-013

Up to four floating input-based RGB Color Correctors can be added to the Synergy 4 MD-X. Each one can modify any one of the 96 possible inputs as seen by the MLEs.

This feature is particularly useful for correcting lighting temperature variations and differences in camera calibration, or for adding creative effects.

Note that color correction does not apply to Aux Buses, or to DSK3 or DSK4, if purchased.

Panel Serial Port Expander S4MDX-015 (Adds 3 RS-422 Ports)

This option connects to any one of the control panel serial ports, and provides four serial port outputs, effectively increasing the number of available panel ports by three. This is a "smart" port expander and works with the Synergy control panel to seamlessly manage external device traffic.

Each Panel Serial Port Expander allows up to four different device types to be simultaneously connected and independently controlled by Synergy. Note that you cannot control a 360 Systems DigiCart audio server using this option.

Multiple Port Expander units may be connected to a Synergy 4 MD-X control panel at one time.

The unit is about 4 inches by 6 inches and is designed to easily mount under the console near the Synergy 4 MD-X control panel.

SD Network Still & Clip Server Option S4MDX-016-x (4 Models)

Note: This option is available in Standard Definition only.

This option adds a fully integrated Still and Clip Server to the system. The –x portion of the part number represents the model of the server that you require.

The following models are available:

Option Number	Description of Network Still and Clip Server
S4MDX-016-N	48 hours of clip storage at 12 Mb/s MPEG-2 compression for NTSC standard
S4MDX-016-P	48 hours of clip storage at 12 Mb/s MPEG-2 compression for PAL standard
S4MDX-016-250-N	100 hours of clip storage at 12 Mb/s MPEG-2 compression for NTSC standard

Option Number	Description of Network Still and Clip Server
S4MDX-016-250-P	100 hours of clip storage at 12 Mb/s MPEG-2 compression for PAL standard

The following features are included in all of the above:

- Virtually unlimited still storage, incorporating both key and fill
- Video animation playout with synchronized key and fill
- Animated logo playout with synchronized key and fill
- 2 dedicated playout channels
- 1 record/play channel for live capture and/or additional playout
- Ethernet connectivity allowing drag and drop of stills and clips over a network
- Included Synergy Video Server Control Interface

This option is the result of a collaborative effort between 360 Systems and Ross Video to provide a comprehensive networkable, high storage, clip and still store system solution.

Note that **S4MDX-903: Video Server Control** *is included* with this option and does not need to be purchased separately. Any number of control panel ports are now activated to control this and any other video server that can be controlled using VDCP (Harris/Louth) Protocol.

Unlike other systems on the market, this solution allows totally synchronized key and fill playout of clips, animations, and stills. Add the ability to drop in graphics and animations over a network using simple MPEG or Targa files, and this becomes an extremely practical and attractive package.

MD-X Inputs, 16 Additional S4MDX-020

The Synergy 4 MD-X comes standard with 16 multi-definition serial digital inputs plus re-entries. All digital inputs can be used direct to air, as key alpha channels, or as chroma key sources.

Additional inputs can be purchased in groups of 16 up to a maximum of 96 multi-definition digital inputs. Therefore, quantities of 16, 32, 48, 64, 80, or 96 inputs are possible.

Inputs can be freely assigned to any panel pushbutton or shifted pushbutton. They can also be "hidden" and accessed only as alpha channels or they can be "locked out" if they are not used. Note that if **S4MDX-x05: Mnemonics for MLE Sources** are purchased, different shows can use completely different sets of inputs optimally arranged on the control panel with labeling that follows.

MD-X Inputs, 16 Additional plus Analog Reference Input S4MDX-020R

This Input Board would be ordered as an emergency backup to the primary reference input in the MD-X frame.

This input board is identical to **S4MDX-020: MD-X Inputs, 16 Additional** except that it has additional circuitry for a system reference input. One input board like this one already comes standard with the Synergy 4 MD-X. Another one would be ordered for system redundancy in the unlikely event of a failure of the primary reference input. If one board failed or was removed, the other board would automatically take over the reference function. The remaining 16 inputs will function as normal.

Outputs, 16 Additional — S4MDX-021

The Synergy 4 MD-X comes standard with 16, multi-definition serial digital outputs.

All digital outputs are fully configurable to be program, preview, clean feed, or Aux Bus outputs. It is recommended that you carefully map out your output requirements to determine the number of outputs needed.

Note also that the MultiDSK option consumes 4 additional digital outputs. Refer to **S4MDX-056: MultiDSK** for more details if this applies to your configuration. Additional outputs can be purchased in groups of 16 up to a maximum of 48 multi-definition digital outputs. Therefore, quantities of 16, 32, or 48 outputs are possible.

$1 Conversion Frame (DFR-8110A, Includes One Power Supply) — S4MDX-023A

Conversion Frame (As Above with Cooling Fan Unit in Door) — S4MDX-023A-C

Note

> The following RossGear Converters and Distribution equipment apply only to **Standard Definition** products. Contact your Ross representative for a listing of available **Multi-Definition** RossGear™ and GearLite™ products.

All *standard definition* switcher inputs and outputs are 10 bit, 4:2:2 serial digital. Signal sources of other video formats must be converted to serial digital. Ross Video chose to do this conversion externally to ensure that the very latest conversion technology and most competitive pricing are available to our customers. An added bonus of external conversion is the ability to use those converters elsewhere in your facility as you eventually upgrade your switcher sources to serial digital.

Ross Video is known as a world-class supplier of encoders, decoders, A-Ds, and D-As. In order to encourage you to purchase your entire system from Ross, sets of conversion rack frames and power supplies can be purchased for the nominal price of $1 US each (cooling fan unit extra) according to the following conditions:

- The order for conversion frames is made at the same time as the order for the switcher.
- The number of frames covered is equal to the number of converters ordered, divided by 10, with all fractions rounded up (i.e. 1 converter = 1 frame, 9 converters = 1 frame, 15 converters = 2 frames, etc.).
- Ross products that qualify as converters are as follows:

Converter	Description
ADC-8032B	Analog Composite to SDI Digital Decoder
ADC-8032B-S	Analog Composite to SDI Digital Decoder with Frame Synchronizer
ADC-8033	Analog Component to SDI Converter
ADC-8035	Dual Analog Composite to SDI Converter
CMA-8011A	SDI Component Monitoring Amplifier
CMA-8011A-7	SDI Component Monitoring Amplifier with 7 reclocked SDI Outputs
DAC-8013	SDI to Analog Component Converter
DAC-8016A	SDI to Analog Composite Converter
DAC-8016A-S	SDI to Analog Composite Converter with Frame Synchronizer
DAC-8016A-SX	SDI to Analog Composite Converter with Frame Synchronizer and X-Color Filter
DAC-8016A-X	SDI to Analog Composite Converter with X-Color Filter
QMA-8044	Quad SDI to Analog Composite Monitoring Amplifier
UMA-8017	Universal SDI Monitoring Amplifier

If your system requires power redundancy don't forget to order an additional power supply per conversion rack frame (PS-8102). These additional power supplies are not included in the $1 offer. Please obtain a current Ross Video Catalog for detailed information on Ross Video's complete line of converters. You may also want to consult with Ross Video or check out our web site at www.rossvideo.com to determine if new converters have been added to our product line since the catalog was released.

Note

Ross Video also offers the GearLite™ line of converters. Contact your Ross representative or visit our website to determine the best solution for your needs.

$1 Multi-Def Conversion Frame - Modular Rear (DFR-8310, Includes One Power Supply) **S4MDX-024**

Multi-Def Conversion Frame – Modular Rear (As Above with Cooling Fan Unit in Door) **S4MDX-024-C**

$1 Multi-Def Conversion Frame - Fixed Rear (DFR-8310, Includes One Power Supply) S4MDX-024-BNC

Multi-Def Conversion Frame – Fixed Rear (As Above with Cooling Fan Unit in Door) S4MDX-024-C-BNC

Note

The following description applies to all four of the above-mentioned Multi-Def Conversion Frames.

All switcher inputs and outputs are 10 bit, 4:2:2 serial digital in HD and SD formats. Signal sources of other video formats must be converted to serial digital. Ross Video chose to do this conversion externally to ensure that the very latest conversion technology and most competitive pricing are available to our customers. An added bonus of external conversion is the ability to use those converters elsewhere in your facility as you eventually upgrade your switcher sources to serial digital.

Ross Video is known as a world-class supplier of encoders, decoders, A-Ds, and D-As. In order to encourage you to purchase your entire system from Ross, sets of conversion rack frames and power supplies can be purchased for the nominal price of $1 US each (cooling fan unit extra) according to the following conditions:

- The order for conversion frames is made at the same time as the order for the switcher.
- The number of frames covered is equal to the number of converters ordered, divided by 10, with all fractions rounded up (i.e. 1 converter = 1 frame, 9 converters = 1 frame, 15 converters = 2 frames, etc.).

Note

Contact your Ross representative for a listing of available **Multi-Definition** RossGear™ and GearLite™ products.

If your system requires power redundancy don't forget to order an additional power supply per conversion rack frame (PS-8300). These additional power supplies are not included in the $1 offer.

Squeeze & Tease MD Carrier, for MLE 1 & 2 S4MDX-140

This is an optional carrier card equipped with a high performance DSP (Digital Signal Processing) module. Only one of these cards must be purchased in order to install any of the following options:

- **S4MDX-141A: Squeeze & Tease MD, Channels 1 & 2 for MLE 1**
- **S4MDX-141B: Squeeze & Tease MD, Channels 3 & 4 for MLE 1**
- **S4MDX-241A: Squeeze & Tease MD, Channels 1 & 2 for MLE 2**
- **S4MDX-241B: Squeeze & Tease MD, Channels 3 & 4 for MLE 2**
- **S4MDX-142: Squeeze & Tease MD WARP, for MLE 1**
- **S4MDX-242: Squeeze & Tease MD WARP, for MLE 2**

Squeeze & Tease MD Carrier, for MLE 3 & 4 S4MDX-340

This is an optional carrier card equipped with a high performance DSP (Digital Signal Processing) module. Only one of these cards must be purchased in order to install any of the following options:

- **S4MDX-341A: Squeeze & Tease MD, Channels 1 & 2 for MLE 3**
- **S4MDX-341B: Squeeze & Tease MD, Channels 3 & 4 for MLE 3**
- **S4MDX-441A: Squeeze & Tease MD, Channels 1 & 2 for MLE 4**
- **S4MDX-441B: Squeeze & Tease MD, Channels 3 & 4 for MLE 4**
- **S4MDX-342: Squeeze & Tease MD WARP, for MLE 3**
- **S4MDX-442: Squeeze & Tease MD WARP, for MLE 4**

Squeeze & Tease MD S4MDX-x41A/B

One Squeeze & Tease MD option provides two channels of 3D planar effects. Each MLE including MLE 4 can have up to two of these options. The first option ordered for an MLE uses the suffix "A" and the second option ordered for an MLE uses the suffix "B". The "x" refers to the associated MLE. A total of 8 Squeeze & Tease MD options can be ordered in a Synergy 4 MD-X, providing an impressive 16 channels of 3D DVE.

An example ordering code would be: **S4MDX-341A**. This would request two channels of planar effects for MLE 3. If four channels of planar effects were desired for MLE 3, then **S4MDX-341B** would also have to be ordered.

If WARP effects are desired on these 3D channels, please refer to option **S4MDX-x42: Squeeze & Tease MD WARP**.

Note that the **S4MDX-x40: Squeeze & Tease MD Carrier** is required to install Squeeze & Tease options.

Squeeze & Tease is an extremely popular option that is sold with almost every Ross digital switcher.

Fly ANY kind of key

Pressing the FLY KEY button easily activates Squeeze & Tease MD allowing you to transform self keys, linear keys, and chroma keys. You are automatically taken into a comprehensive and intuitive user menu, where you can set up your desired effects. If you prefer, the 3-axis joystick can also be used to adjust your key's parameters.

Preprocessor Effects

Preprocessor effects include wide range defocus with separate H and V controls, mosaic, posterization, colorization, and a strobe effect that allows you to vary the number of on and off frames to provide enhanced creative possibilities. All preprocessor effects are available to be combined simultaneously.

Planar Transforms with Lighting

Squeeze & Tease MD has dedicated circuitry incorporating 10-bit processing, superb filtering, and full sub-pixel resolution to manipulate 2D images in 3D space with crystal clear quality.

Planar transforms include squeeze or zoom, crop, reposition, aspect, and rotate. These effects can be applied to images and keys.

All images and keys can also have realistic natural lighting applied to them. Squeeze & Tease MD makes it easy with "quick presets", a positionable light source, and powerful ambient and min/max lighting controls.

Advanced Picture Frame Border Generator

Squeeze & Tease MD can add a picture frame to border over-the-shoulder boxes. This variable width border perfectly tracks all image resizing and special effects. The picture frame generator instantly adds a polished, professional look to your squeeze backs.

This picture frame can be the simple, single color type, or one of many fancy picture frame effects including roman column, tubular, beveled, computer style, tri-color, and more. These picture frame effects have the following adjustable controls:

- hard or variable edge softness
- edge width/scaling
- inside/outside edge softness symmetry
- diagonal, horizontal, and vertical corner joint selection
- full control of all three picture frame color generators.

Advanced Planar Controls

The following advanced controls make building the ideal look for your show just that much easier:

- **Front Side/Back Side** in one channel and one keyer. When you look at the backside of an effect, you can have it automatically select a different video signal on the key bus. This makes it possible, for example, to rotate between 2 channels of still store in an over the shoulder box in a single keyer, using only 1 channel of S&T MD.
- **Auto Flip**. When you rotate an image in normal mode, the backside appears upside down or mirrored. Turning on Auto Flip ensures that the front side of an image is always presented. This is great for the manipulation of still store and CG text.
- **Internal Key Combiner.** Squeeze backs can be combined and displayed in a single keyer. This effectively adds more keyers to the Synergy MLE.
- **Key Combiner Priority Control.** Getting the channels the way you want them is easy with S&T MD. When several squeeze backs are combined in a single keyer, you can choose fixed priorities, auto-priority, or intersecting planes. Auto-priority automatically calculates the channel priority based on their relative positions in 3D space. With the intersecting planes choice, channels will literally cut into one another channel hiding the portions that are hidden behind them.
- **Easy Slabs and Objects.** Squeeze & Tease MD provides a simple and intuitive user interface to combine two or more planes into a slab and then manipulate it as a single object. S&T MD deals with the math and you get a great looking slab the way you want it within seconds.

Pre-Built Effects, User-Built Timelines, and Key Sequences

Squeeze & Tease MD ships with dozens of prebuilt effects that are ready to take to air. More effects can be downloaded from our website. All of these effects can be easily user modified to meet your needs. You can also build entirely new effects of your own from scratch.

Effects can be built to start when a macro button is pressed, when an auto transition is pressed, or can be run under manual fader control. Effects can be used as a transition, or as a sequence of keyframes running inside one or more keyers.

Squeeze & Tease MD WARP S4MDX-x42

Squeeze & Tease MD WARP adds extensive curvilinear effects to an MLE with Squeeze & Tease MD installed. These effects can be applied to transitions or keys where a planar channel or key-combined group of channels is being used.

The "x" in the ordering number refers to the associated MLE. A total of 4 Squeeze & Tease MD WARP options can be ordered in a Synergy 4 MD-X.

Warp Effects

Warp effects include page turn, ripple, wave, swirl, melt, twist, slats, splits, sphere, lens, magnifier, star, heart, old film, shards, corning pinning, lens flare, and many more.

Creative possibilities are endless as S&T MD WARP effects can be easily combined with preprocessor, planar transformation, lighting, and picture frame effects!

All of the S&T MD WARP effects are user modifiable to help you get just the look you want.

XFX Board with MLE-Store and MediaCache Options S4MDX-x43-SC

This option adds an XFX Extra Effects Processor Board to the MLE, and includes Multi-Def MLE-Store and MediaCache options. The "x" in the ordering number refers to the associated MLE. A total of 4 XFX Board with MLE-Store and MediaCache Options can be ordered in a Synergy 4 MD-X.

The MLE-Store option adds four channels of Still Store. Still store channels can be paired for video + key operation.

MLE-Store comes standard with 256MB of RAM storage, enough for at least 30 full screen 1080i images with key or 189 full screen 480i images with key. The number of images stored increase considerably when smaller, non-full screen images like logos are stored. Thousands of additional images can be loaded quickly from the system hard drive. When the optional MediaCache is enabled, the playout capabilities and storage capacity of the MLE-Store is increased considerably. All images stored in this memory are available simultaneously to all MLE-Store outputs in the MLE.

MLE-Store has a production advantage over the Global-Store because stills are automatically recalled with MLE memory recalls. The Global-Store feeds sources switcher-wide and are therefore not part of memory recalls.

MLE-Stores are accessed as Program, Preset, and Key Bus source buttons on the Synergy control panel.

A Synergy 4 MD-X can have up to 19 still stores running simultaneously when the 3 Channel Global-Store and all MLE-Stores are installed.

MediaCache for MLE-Store works the same as MediaCache for Global-Store. Each MLE-Store output is capable of playing full bandwidth clips independently and simultaneously.

The purchase of MediaCache for MLE-Store increases the RAM capacity available to the MLE from 256MB to 1GB. This allows storage of up to 4 seconds of uncompressed 1080i playout or 25 Seconds of 480i playout.

Enables the Dual Border Option on the XFX Board Above — S4MDX-x43K-B

This adds the Dual Border option to the **S4MDX-x43-SC: XFX Board with MLE-Store and MediaCache Options** above. The "x" in the ordering number refers to the associated MLE. Refer to **S4MDX-x43-SB: XFX Board with MLE-Store and Dual Border Options** below for a description of the Dual Border option.

XFX Board with MLE-Store and Dual Border Options — S4MDX-x43-SB

This option adds an XFX Extra Effects Processor Board to the MLE, and includes Multi-Def MLE-Store and Dual Border options. The "x" in the ordering number refers to the associated MLE. A total of 4 XFX Board with MLE-Store and Dual Border Options can be ordered in a Synergy 4 MD-X.

The MLE-Store option adds four channels of Still Store. Still store channels can be paired for video + key operation.

MLE-Store comes standard with 256MB of RAM storage, enough for at least 30 full screen 1080i images with key or 189 full screen 480i images with key. The number of images stored increase considerably when smaller, non-full screen images like logos are stored. Thousands of additional images can be loaded quickly from the system hard drive. When the optional MediaCache is enabled, the playout capabilities and storage capacity of the MLE-Store is increased considerably. All images stored in this memory are available simultaneously to all MLE-Store outputs in the MLE.

MLE-Store has a production advantage over the Global-Store because stills are automatically recalled with MLE memory recalls. The Global-Store feeds sources switcher-wide and are therefore not part of memory recalls.

MLE-Stores are accessed as Program, Preset, and Key Bus source buttons on the Synergy control panel.

A Synergy 4 MD-X can have up to 19 still stores running simultaneously when the 3 Channel Global-Store and all MLE-Stores are installed.

The Dual Border option provides border, shadow, and outline effects to both keyers in an MLE with either hard or "glowing" edges. You can then move the border to any position on the screen - even above the key. Borders are "flown" in real time with the joystick in

the same manner as wipe patterns and DVE effects. This border generator was designed as a creative tool and it can add an impressive visual impact to your keys.

All border edge effects can be modified through the parameters of x and y position, border size, border color (including color washes), density, and glow (giving a soft defocused look).

The border generator can enhance any kind of switcher key including self keys, linear keys, chroma keys, and preset pattern keys. In Synergy, borders are particularly effective for enhancing Squeeze & Tease over-the-shoulder boxes making them appear to "float" over their backgrounds.

Enables the MediaCache Option on the XFX Board Above — S4MDX-x43K-C

This adds the MediaCache option to the **S4MDX-x43-SB: XFX Board with MLE-Store and Dual Border Options** above. The "x" in the ordering number refers to the associated MLE. Refer to **S4MDX-x43-SC: XFX Board with MLE-Store and MediaCache Options** above for a description of the MediaCache option.

Mini Satellite / Remote Aux Panel (Includes 10 Meter Control Cable) — S4MDX-050A

The Synergy MD Mini Satellite Panel is a 1 RU, rack-mountable control panel that can be used to switch crosspoints, initiate transitions, and trigger up to four custom control macros. Source buttons are fully assignable and can be mapped differently than the main Synergy control panel.

Application examples for this option include:

- Direct crosspoint selection on an MLE, allowing a director to cut to cameras on one of the Synergy's MLEs.
- AuxKey control, when used in conjunction with the unique AuxKey option, to provide a panel with which to select a background source and key source, and perform a background and/or key transition.

Mini Satellite panel configuration settings are stored to the Synergy MD's internal hard disk and can be recalled instantly with the rest of the switcher settings on a show-by-show basis.

Custom Cable for Aux Panel (Per Meter, Replaces 10 Meter Cable) — S4MDX-054-xxx

The Mini Satellite/Remote Aux panel comes standard with a 10-meter control cable. If lengths of other than 10 meters are needed, this option is required. The -xxx portion of the part number represents the total cable length in meters.

For example: 2 seven-meter cables and one 20-meter cable are required. Order

- quantity 2 of **S4MDX-054-007**, and
- quantity 1 of **S4MDX-054-020**.

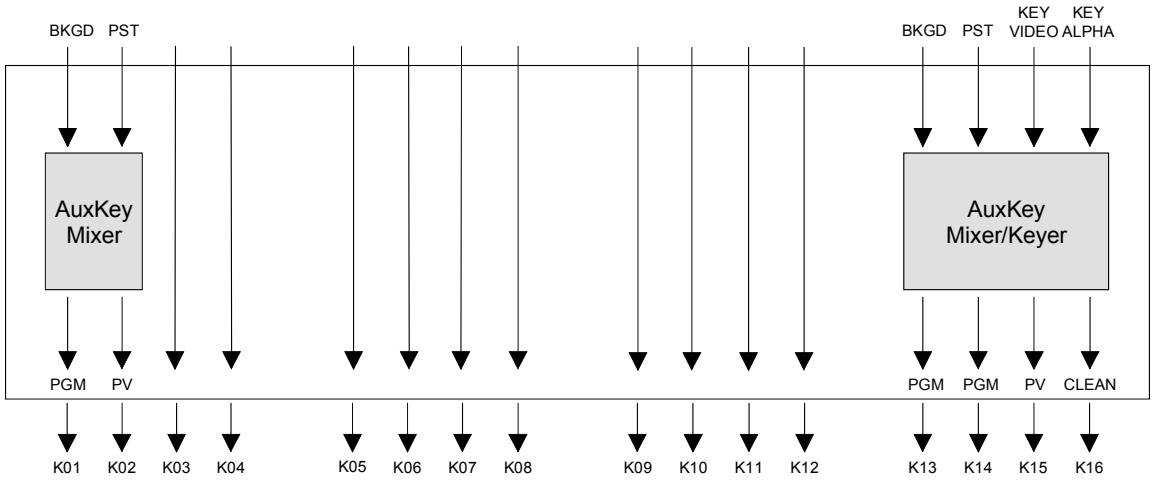
AuxKeys™, System Wide S4MDX-055

This revolutionary and highly recommended option turns Aux Buses into A/B mixers or mixer/keyers. Key and mix sources are fed from adjacent Aux Buses that have access to every signal in the switcher. Mix or key operations can be previewed and clean feed is available also – this is very much like a simple MLE. **The use of a single AuxKey can free up an entire MLE in many applications.** Of particular interest in this application are Global-Store outputs that, with MediaCache enabled, can provide animated logo capability.

AuxKeys can be used two ways:

- Mixer (mix between two video buses)
- Mixer/Keyer (mix and key – required 4 buses)

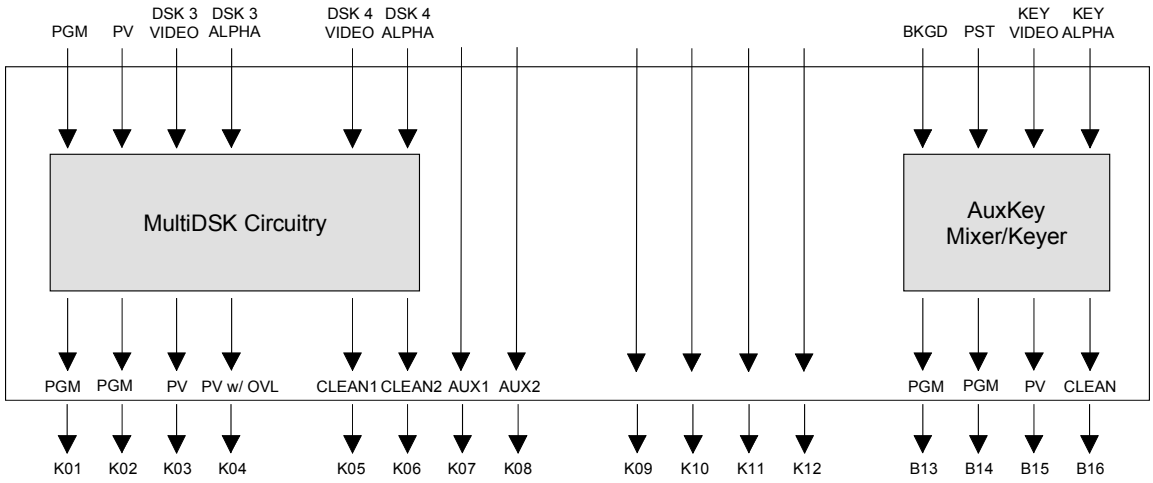
Switcher outputs are assigned to AuxKeys in groups of four. A maximum of 11 AuxKeys may be enabled on a Synergy 4 MD-X. This would require the installation of three output cards. If MultiDSK is purchased and activated, the maximum possible number of AuxKeys is reduced to 10. The diagrams below show sample configurations of AuxKeys, both with and without option **S4MDX-056: MultiDSK** installed:



AuxKey Configuration without MultiDSK Option Installed

In the above example:

- The first group of four is configured as a simple mixer freeing up outputs K03 and K04 to be used as fully configurable outputs.
- The second and third groups of four are not configured as AuxKeys and are fully configurable.
- The last group of four is configured as a mixer/keyer. Output K13 is the first AuxKey "program" output, output K14 provides an identical second AuxKey program output, output K15 is the AuxKey preview output, and output K16 is a Clean feed output taken after the mix stage but before the keyer.



AuxKey Configuration with MultiDSK Option Installed

In the above example:

- The first two groups of four are used to provide the optional **S4MDX:056 MultiDSK** circuitry with video sources for DSK 3 and DSK 4.
- The third group of four is not configured as AuxKeys and is fully configurable.
- The last group of four is configured as a mixer/keyer. Output K13 is the first AuxKey "program" output, output K14 provides an identical second AuxKey program output, output K15 is the AuxKey preview output, and output K16 is a Clean feed output taken after the mix stage but before the keyer.

AuxKeys significantly increase the keying power of the switcher but do so without tying up an MLE. AuxKeys are configured using the menu system, and controlled via Custom Control macro buttons, or by temporarily using the buttons of an MLE.

Applications for AuxKeys include:

- Downstream bug insertion. This can ensure that a logo remains inserted regardless of what is being done in the MLEs. *This frees up MLE keyers.*
- Multi-language applications. Add CG keys to clean feed outputs. *This often frees up one or more MLEs.*
- Multi-client applications. Add keys to MLE outputs that present a variation on the main program output. *This often frees up one or more MLEs.*
- Multicasting. Produce programming for two regions simultaneously but brand them differently without consuming MLE keyers and adding production complexity. *This frees up MLE keyers.*
- Stadium concourse and box seat monitors. Add different sponsor branding to different stadium locations. *This frees up MLEs and eliminates the need for costly and complex external keyers.*
- Pre-keying. Add keys to sources before they are brought into the switcher MLEs. Time the AuxKeys early and the MLEs late and sources can be fed back into the switcher as inputs. *This frees up MLEs or unwieldy external keyers.*
- Pre-mixing. Mix between two sources before they are brought into the switcher MLEs. This makes it possible to dissolve inside any number of DVE boxes while

only consuming a single MLE. *This effect would normally take one MLE for every DVE box!*

- Studio Plasmas. If your set has multiple live plasma displays with images that require keys to be inserted, AuxKeys are an ideal, cost-effective solution. *This frees up MLEs or external keyers.*

MultiDSK™ (DSK 3 and DSK 4) S4MDX-056

This option adds a third and a fourth linear downstream keyer to the pair of standard internal DSKs. These downstream keyers have access to every Synergy MD video source and are fully integrated into the MLE 4 transition system with full preview.

Note that the hardware for this option resides on the output card where the MLE4 Program and Preview outputs reside, and will consume four additional multi-format outputs in order to supply the DSKs with video and key sources.

MultiDSK will always provide the following outputs:

Output Number	Output Provided
K01	Program
K02	Program
K03	MLE 4 Preview
K04	MLE 4 Preview with Overlay
K05	Clean Feed 1
K06	Clean Feed 2

One clean feed precedes DSK 3 and the other precedes DSK 4.

Extended Tallies (37-72) S4MDX-070

The standard system includes 36 tally relays. Any tally can be assigned to any video input (or MLE Program output) making 36 enough for most systems. An optional 36 additional tallies (bringing the total number of tallies to 72) can be ordered for large input matrix configurations, red/green preview tally systems, and Aux Bus tally systems that require twice as many tallies or for cases where every single input must be tallied.

A preview tally system has a "red" output indicating that a source is on air and a "green" output indicating that a source has been selected on a preset bus. This gives the talent an additional warning as to the director's next move.

Redundant Power (Frame and Panel) S4MDX-071

The redundant power supply option provides protection against AC power failure. It allows the switcher to receive power from independent power sources. Complete failure of one source will not affect the operation of the switcher in the slightest. If the main AC power fails, the switcher instantly draws power from the remaining source. The transition from one power source to the other is totally transparent and has no affect on the

switcher's output; a critical feature should one power source fail during an on air broadcast.

The Synergy MD-X rack frame uses an N+1 power supply organization. Two power supplies can provide the complete power requirements of the frame. A third power supply, purchased with this option, adds redundancy in the event that one power source or power supply is lost. All rack frame power supplies are fully hot swappable without affecting switcher operation.

The fourth power supply slot is not used at this time.

There are two power fail indicator lights on the main panel. They indicate the following:
- loss of redundant power in the rack frame,
- loss of redundant power in the control panel.

In the rack frame, there are lights visible from the front of the unit that indicate the following:
- All okay
- Supply 1 failure
- Supply 2 failure
- Supply 3 failure
- Supply 4 failure
- Cooling fan failure

Adding redundant power does not increase the amount of rack space required by the switcher. It mounts inside the main electronics chassis.

Spare Parts Kit S4MDX-073

It would be far too expensive to put every switcher part in the Spare Parts Kit. Parts were chosen for the kit using the following criteria:
- The part comes into frequent contact with the user.
- The part can be easily damaged or may wear out with excessive use.
- The part can be damaged by connecting excessive voltage to an external connector and is easily repairable in the field.
- The part is used in system power management and is easily repairable in the field.
- The part can be lost easily.

Parts that fall outside of the above criteria are not included.

An exception to the above criteria is rack frame and control panel power supplies. These are expensive parts and spares are ordered separately.

Note: A major item included in this kit is a **loaded replacement system hard disk drive**. This Ross-approved 80GB drive contains boot software, Linux OS, switcher system software, and standard video images. For critical on air applications, this option is recommended.

Critical Spare Boards Kit S4MDX-074

This is a package of critical boards for which there is no redundancy within the Synergy MD-X switcher and cannot be purchased as individual options. It includes:

- Frame CPU Board (Main Chassis CPU)
- 144x144 Crosspoint Board
- Frame Fan Unit
- Panel Controller Board (Control Panel CPU)

The system Midplane Board is not included, as it contains no active components.

Custom Cable for Main Control Panel S4MDX-075-xxx (Per Meter, Replaces 10 Meter Cable)

This cable connects the control panel to the electronics rack frame. It is a shielded 8-pin Telco cable and the ends are finished with the appropriate connectors. The control panel and rack frame can be separated by a maximum of 300 meters.

The switcher comes standard with a 10-meter control panel cable. If lengths of other than 10 meters are needed, then this option is required. The -xxx portion of the part number represents the total cable length in meters.

For example: a 50-meter control panel cable is required. Order:

- quantity 1 of **S4MDX-075-050**.

Redundant Power (Control Panel Only) S4MDX-076

This is redundant power for those who have replaced or upgraded their panel and already have redundant power in their frame.

Redundant Power (Rack Frame Only) S4MDX-077

This is redundant power for those who have replaced or upgraded their frame and already have redundant power in their control panel.

Editor Interface S4MDX-900

It is common to use an editor to control a video production switcher in linear editing and packaging applications. With the editor interface option, the Synergy 4 MD-X can interface to all popular editing systems. Any MLE or combination of MLEs can be controlled using an RS-232 or RS-422 interface and industry-standard GVG* 100 or 4000 editor protocol. The editor can be used to read and write switcher functions including video input selection, pushbutton enable and disable, control settings, and memory registers. If complete control of all switcher parameters from an editor or remote device is necessary, this option is required.

Note that an alternative to the serial interface is GPI triggers, which come standard with the Synergy 4 MD-X. GPI triggers can be assigned to press any button on the control

* GVG is a trademark of Thomson Multimedia.
**Sony is a trademark of Sony Corporation

panel via the Custom Control macro system. GPIs can also be programmed to press cut or auto transition buttons directly.

VTR Remote Control S4MDX-901

This option makes it possible to control multiple VTRs, disk recorders, video servers, or other devices that use the near-universal Sony** BVW-75 Betacam protocol - directly from the switcher panel.

Every MLE's transition area has a ROLL VTR button. When that button is pressed, a play command is sent to the device selected on the preset bus. Once the preroll time is over, the operator takes the source to air - with precise timing guaranteed. The ROLL VTR button can also be assigned to "arm" the cut and auto transition buttons. In this mode, pressing the cut and auto buttons will roll the VTR on preset, wait the preroll time associated with that device, and *then* proceed with the transition.

The VTR CLIP button in the Global Memory System area is used to cue up the next VTR. Each clip memory has an associated device (e.g., VTR RED) and a stored time code. Frequently used video clips can be accessed over and over at the touch of a button.

VTR Remote Control can also be tied into the Custom Control buttons. Any Custom Control button can be attached to functions such as cue to time code, play, stop, rewind, fast forward, frame advance, gang roll, and more.

DVE Send and Remote Control S4MDX-902

The Synergy series of switchers was designed to work with most popular brands of DVEs seamlessly as if they were part of the switcher during on air production. The DVE Send and Remote Control option makes this possible.

It's as easy as selecting the next transition (BKGD, BKGD and key, or key), the DVE SEND transition type (as opposed to wipe or dissolve), and press the auto transition button. Transitions do not consume a keyer, as there is a third hidden keyer in each MLE just for DVE re-entries. The switcher also handles all Aux Bus and signal routing issues automatically.

Depending upon the capabilities of the DVE, transitions can also be run manually with the fader bar.

DVE effects can be recalled directly using the RECALL DVE button in the Global Memory System area. DVE effects will be recalled along with MLE memory recalls when the INCL DVE button is illuminated.

To top it off, your tallies will always be correct - regardless of the complexity of the video signal routing.

Video Server Control S4MDX-903

This is a very powerful interface. It enables control over multiple channels of video server using the VDCP (Harris/Louth) Protocol. Clip name and duration are displayed in the Synergy System Control Area. The video server interface can be used to cue and roll clips

that are used during a live production. This is ideal for commonly used clips such as opening animations and animated backgrounds that are used again and again.

While setting up a clip for later recall, Synergy can download up to 1000 clip ID's from the server and then sort them alphanumerically. The user then easily chooses the clip for later recall. The server clips can also be chosen directly by name. Once chosen, in points and out points can be added to the clip on Synergy without affecting the original clip on the server. This is done while moving through the video in real time. A constantly updated bar graph summarizes the process. The current time code is also displayed on the Preview Overlay. Finally, the clip can be given a unique name on Synergy to simplify later recall.

During a live production, clips from any device can be cued directly from the Global Memory keypad. Clips for a particular server channel can be accessed by selecting the channel on a preset bus, and then choosing from a list of named Synergy clips. The dedicated menu for that server channel also provides controls for cue, play, stop, fast forward, and rewind.

Audio Server Control S4MDX-904

The Audio Server Control option enables control for up to eight 360 Systems DigiCart™ audio servers. This interface uses the DigiCart native protocol and allows the Synergy operator to dial up the hard drive, directory and clip number.

The clip name and duration is displayed on the Synergy System Control Area. Clips can be saved into a clip list and recalled instantly with VTR and video server Clips. Using Custom Control macros, audio clips can be tied to video effects for the *whoosh on page turn* and other effect types.

Note: You cannot control a 360 Systems DigiCart Audio Server using the Remote Serial Port Expander.

Routing Switcher Interface S4MDX-905

This option adds routing switcher interface capability to your Synergy digital production switcher.

Any number of the Synergy MD-X's 96 inputs can be assigned as a router input. When you select a source fed by a router on the program or preset bus, the router control menu automatically appears. The router menu shows Synergy's name for the source (e.g., ROUTER1) and the router's name for the source (e.g., VTR12). The router menu also displays every source available on that router by name and by router input number. The menu knobs allow for fast access to every available source. A single button push automatically assigns the chosen source to Synergy.

Preview Overlay also comes into play with routers. When the Source ID display is active on the preview monitor, router sources selected on the background or preset buses are given extra identification. In the example above, Synergy would display both the name ROUTER 1 and VTR 12 to give the full picture of the source's origins.

In the same example, with the Mnemonics option installed, Synergy replaces the pre-programmed Synergy name (ROUTER 1) with the router's name of the source (VTR 12) on the crosspoint's mnemonic display. This provides easy identification of all inputs coming from your router.

Synergy can connect to multiple different routers, and even multiple different brands of routers, *simultaneously*. All of the following router protocols become available with the purchase of this option, and are selectable via the switcher menu system:

- Ross Routing Systems
- Pesa
- Pro-Bel
- Utah Scientific
- Quartz
- Philips

If your router is not on the above list, please contact your Ross sales representative as new routers are being added all the time.

Serial Tally Interface S4MDX-906

This option enables Serial Tally Interface using industry standard protocols to Under Monitor Display and Tally Systems. The standard parallel tally interface will continue to operate normally when this option is enabled.

Peripheral Bus II Interface S4MDX-907

This option enables support for Thomson GVG Peripheral Bus II Protocol for external device integration. Devices that support this protocol (such as some still stores, CGs, and device controllers) will be directed to store their settings when Synergy stores its settings and then do a coordinated recall when Synergy performs a recall.

Still Store (Chyron Aprisa) Interface S4MDX-908

This option enables serial ports for control over the Chyron Aprisa Still & Clipstore. It allows a user to randomly access any still or clip under control from Synergy. Custom Control macros can also be created for quick and direct access to clips and switcher scene recalls.

Audio Mixer Ganging S4MDX-910

This option provides the protocol converters required to control a pair of cascaded Yamaha Audio Mixers simultaneously. Either the Small Audio Mixer Interface or the Large Audio Mixer Interface options must also be purchased.

Included in this option are the MIDIator Systems MS-124W converter box and the Midi Merger unit.

Small Audio Mixer Interface (16 and Fewer Inputs) S4MDX-911

This option enables serial control for enhanced audio-follow-video from Synergy over small audio mixers, making an integrated A/V production possible.

Synergy goes far beyond simple audio-follow-video. It allows for easy audio over, easy attachment of several audio sources to one video source, and quick level control of master and individual audio levels. Even audio voice-over control directly from the Synergy control panel is possible.

It is possible to purchase the small but powerful Yamaha 01V96 audio mixer console through any Ross Video distributor. This mixer has up to 16 analog inputs, 16 digital inputs, and a proven interface to our production switchers. Call for the list of other currently supported mixers.

Large Audio Mixer Interface (More than 16 Inputs) S4MDX-912

This option enables serial control for enhanced audio-follow-video from Synergy over large audio mixers, making an integrated A/V production possible.

Synergy goes far beyond simple audio-follow-video. It allows for easy audio over, easy attachment of several audio sources to one video source, and quick level control of master and individual audio levels. Even audio voice-over control directly from the Synergy control panel is possible.

Call for the list of currently supported mixers.

Robotic Camera System Interface S4MDX-913

This option enables serial control over robotic camera systems including pan, tilt, zoom, focus, and scene recalls, and more. This is great for controlling studio cameras, ceiling cams, or roof top cameras.

Call for the list of currently supported robotic camera systems.

Character Generator Interface S4MDX-914

This option allows you to control your CG directly from the Synergy control panel. Using the keyboard attached to the switcher you can load pages, view the text on the control panel display, and even change the text directly on the CG. Fixing typos has never been easier! As well, you can load and view play lists, move pages within play lists, and set up custom control macros to instantly load frequently used CG pages such as "Breaking News", "Coming Up At Six", or talent names.

SmartConversion™ Cross Converter Tie Line Management S4MDX-915

SmartConversion™, with Aux Bus Tie Line Management technology, is an up/down conversion loop-through that allows you to produce an output video that uses both SD and HD inputs simultaneously. With all buses in the switcher supported, including key and utility buses, true multi-format production is extremely easy. Simply route the signal to be converted through one of the Aux Bus outputs to an external cross converter, and reenter the converted signal back into a switcher input.

As not all of your video sources are used at the same time, there is no need to convert them all simultaneously. With SmartConversion, you share your expensive up/down

conversion resources by switching them into the signal path only when needed. Better yet, the converters are engaged *automatically*, making the operation seamless.

In keeping with our tradition of superior interface capabilities, SmartConversion can be used with any brand of the external cross converters available in the market…in any format!

Additional Engineering Manual S4MDX-080

This manual contains instructions on how to install the switcher into a facility and how to connect various external devices. It also covers after-sale option installation and provides some basic information on system maintenance.

Additional Operator's Manual S4MDX-081

This manual contains all of the information required to run the switcher on a day-to-day basis.

Onsite Operational Training, 1ST Day S4MDX-090

Although Synergy was designed to be as easy as possible to install and operate, training is *highly* recommended to ensure that the process of taking your Synergy to air is a smooth one.

Training courses can be conducted at the customer's site or at Ross facilities. Expenses are included in North America. A minimum of four weeks advance notice is required for training to ensure we can efficiently schedule the best possible training staff for your requirements. Onsite training is provided on the customer's switcher.
Customers are not charged for the travel time of the trainer.

Onsite Operational Training, Additional Day S4MDX-091

One full day of training on the Synergy 4 MD-X will meet most customer needs. Additional time may be required to handle multiple training groups or if the operators have never used a production switcher before.

Onsite Technical Training, Two Days S4MDX-092

With Synergy onsite technical training, the customer's technical staff is introduced to the following:

- Basic operation
- Switcher installation and configuration
- Peripheral interfacing
- Video signal flow
- System timing requirements
- Circuit block diagrams
- Circuit board overviews
- Jumpers and indicators
- Troubleshooting tips
- Software upgrading
- Routine maintenance

Onsite Commissioning, Two Days S4MDX-093

Synergy Onsite Commissioning is a great way to ensure that your Synergy is properly installed into your facility and tuned to maximum performance.

Once the customer has installed and cabled the equipment, a Ross Commissioning Expert will come on site to get the switcher configured, verify that all peripheral interfaces are operating properly, provide a basic technical orientation, and help you get on the air. Please note that commissioning does not replace operator or technical training. Contact your Ross representative to discuss which types of assistance are best suited to your needs.

Extended Warranty, System S4MDX-999

This extends the standard three-year warranty by one year.

Technical Support

At Ross, we take pride in the quality of our products, but if problems occur, help is as close as the nearest telephone.

Our 24 Hour Hot Line service ensures you have access to technical expertise around the clock. After-sales service and technical support is provided directly by Ross personnel. During business hours (eastern standard time), technical support personnel are available by telephone any time. After hours and on weekends, emergency technical support is available. A telephone-answering device will provide the names and phone numbers of technical support and field service personnel who are on call. These people are available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

Repair and Warranty Policy

The Synergy Series is backed by a comprehensive three-year warranty with the exception of Synergy fader assemblies, which are guaranteed for the life of the product. Our warranty is transferable to subsequent owners. For a more detailed description, please see our warranty document.

Specifications

Physical Characteristics

Control Panel

Width	56.25” (142.9 cm)
Height	12.5” (31.8 cm)
Depth	29.0” (73.7 cm)
Height above desktop	10.0” (25.4 cm)
Primary pushbuttons	35

Desk Cutout Size

Width	54.75” (139.1 cm)
Depth	28.0” (71.1 cm)

Rack Frame

Width	19” (48.3 cm)
Height (8 RUs)	14.1” (35.8 cm)
Depth (rack ears to BNCs)	25” (63.5 cm)

Rack Frame Connector Types

Video I/O	BNC Type
Periph 1, 2, 3, & 4	D type, 9 pin
GPI I/O	D type, 25 pin
To control panel	8 pin shielded RJ 45
10/100 Ethernet #1 and #2	RJ 45
USB #1 and #2	USB 1.1 Type A (host)
Timecode	BNC Type
AC power #1, #2, #3, and #4 (N+1 configuration)	3 pin IEC

Control Panel Connector Types

Peripheral 1 through 8	D type, 9 pin
Tally out 1 through 4	D type, 25 pin
Remote Aux Panel 1 and 2	Telco, 6 pin
Keyboard Port	IBM PS/2 Type
To rack frame	8 pin shielded Telco
AC power 1 & 2	3 pin IEC with Locking Retainer

Power Consumption – Control Panel

Input voltage	90V~250V AC, 47~63Hz
Control panel	350 VA

Power Consumption – Rack Frame

Input voltage	100V~120V AC **or** 220V~240V AC 47~63Hz
S4 MD-X Frame (with no options)	~ 225W
Frame (with all options)	~ 975W

Environmental Characteristics

Panel and rack frame separation	1000 ft (305 m) max
Ambient temperature range	0 – 40 degrees C

- The video processing circuitry is cooled by a set of fans using side-to-side airflow. The fans are speed controlled by multiple temperature sensors within the frame.
- The control panel is convection cooled (no fans) for silent control room operation.

Video Characteristics

Video Processing

- 10 bit 4:2:2 component digital video and key processing
- The following video formats are supported:

1080i/59.94	SMPTE-274M, SMPTE-292M
720p/59.94	SMPTE-296M, SMPTE-292M
1080i/50	SMPTE-274M, SMPTE-292M
480i/59.94 (SD 525)	SMPTE-125M, SMPTE-259M
570i/50 (SD 625)	ITU-R BT.601-5, SMPTE-259M

- Contact Ross Video as additional format compatibility is planned
- 4:3 and anamorphic 16:9 switchable aspect ratio where applicable

Video Inputs

Number of external inputs	16, 32, 48, 64, 80, or 96
Equalization (using Belden 1694 cable)	> 75m @ 1.5Gb/s > 150m @ 270Mb/s
Impedance	75 ohm, terminating
Return loss	> 20 dB @ 1.5GHz

- All inputs are SMPTE-259M/292M serial digital non-looping.
- The Synergy 4 MD-X comes standard with 16 inputs and additional inputs are purchased in groups of 16.
- Inputs can be used for either key or video.
- The reference input is selectable, analog black for Standard Definition operation, and tri-level sync is recommended for High Definition operation.
- The reference input is a looping, non-terminated input.

Video Outputs

Number of Outputs:

Number of video outputs:	16, 32, or 48

- The Synergy 4 MD-X comes standard with 16 outputs and additional outputs are purchased in groups of 16.

Output Characteristics:

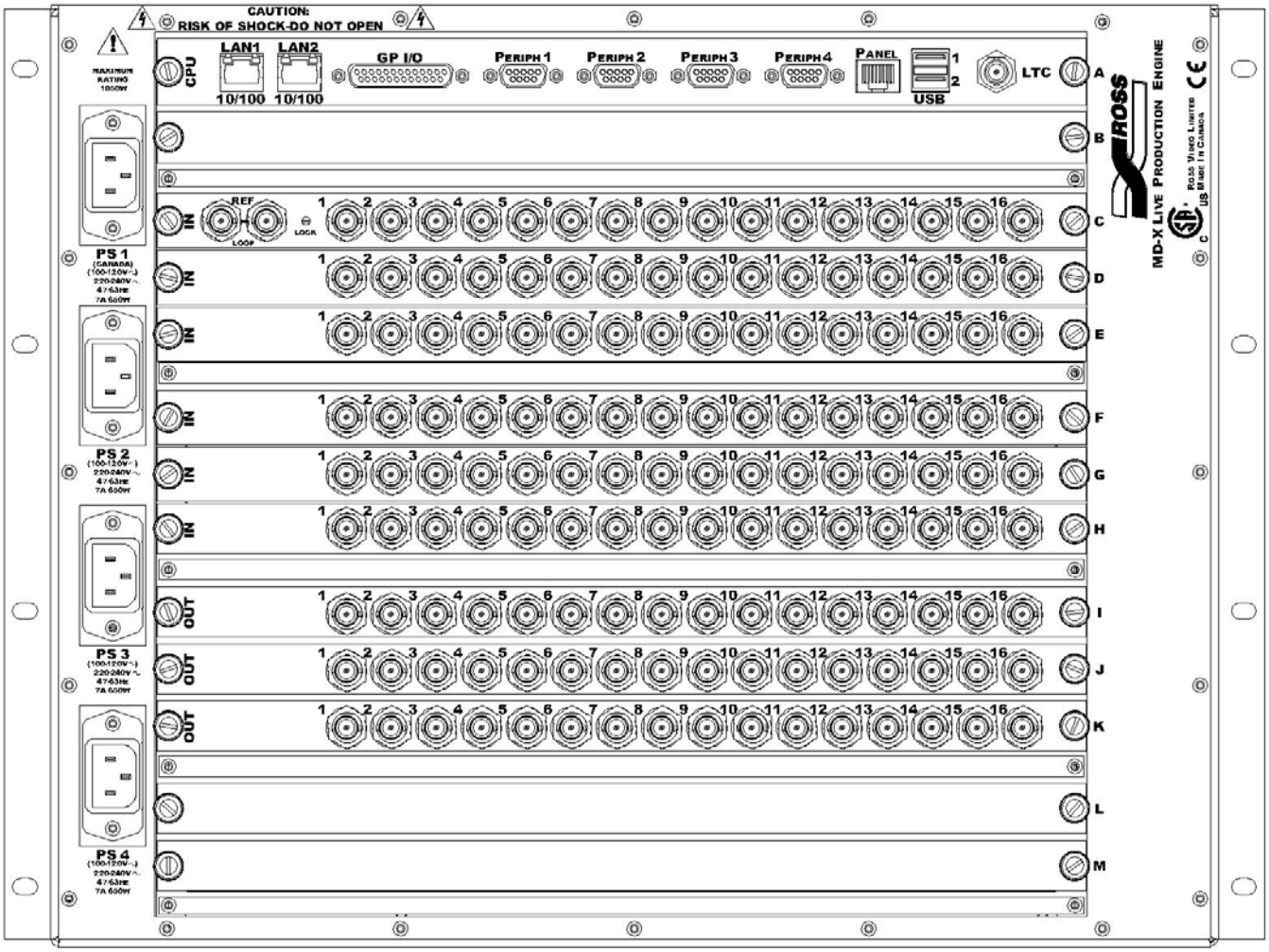
Return loss	> 18 dB @ 1.5GHz
Output Jitter	< 130ps
Rise and fall time	800 ps +/- 10% (SD) 240ps +/- 10% (HD)
Signal level	800 mV +/- 10%
DC offset	0 volts
Overshoot	< 8%

- All video outputs are 10-bit SMPTE-259M-C (SD Mode) or 10-bit SMPTE-292M serial digital (HD Mode).
- EDH is inserted into all MLE outputs and can be disabled. Aux Bus outputs do not have EDH insertion but do pass previously inserted EDH.

System Timing

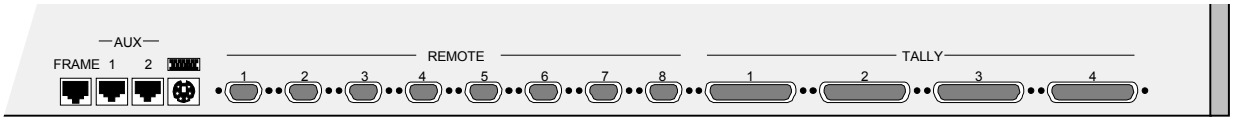
- All video inputs zero time relative to reference input, auto timing will correct for inputs out of time by up to **+/-** 0.25 line
- System delay approximately 400 pixels.

Note: Specifications are subject to change without notice.



Synergy MD-X Rack Frame – Rear View, Fully Loaded

Note: Synergy MD-X switchers meet applicable world standards for safety, emissions, and immunity.



Synergy Control Panel - Right Rear View – Serial Ports

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REQUEST FOR QUOTE

PAGE __ of __

CUSTOMER INFORMATION

Company _____

Contact Name _____

E-mail _____

Telephone (s) _____

Address _____

_____

_____

_____

Item #	Option Number	Option Name	Quantity Required

FAX TO: Ross Video Limited, P.O. Box 220, 8 John St., Iroquois, ON., Canada K0E 1K0
Fax. (613) 652-4425